

Taxonomic notes on *Acosus* Dyar and *Parahypopta* Daniel (Cossidae)

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Abstract. While studying material of Cossidae from North America it was found that *Acosus* Dyar, 1905 is a synonym of *Lamellocossus* Daniel, 1956, **syn. n.** Thus, the following combinations are made: *Acosus terebra* ([Denis & Schiffermüller], 1775) **comb. n.** and *Acosus viktor* (Yakovlev, 2004) **comb. n.** Genus *Acosus* includes five species and is Holarctic in distribution. The type and topotypical specimens of *Parahypopta caestrum radoti* (Homberg, 1911) were investigated. Distinct features of pattern and morphology differentiate it from *Parahypopta caestrum* (Hübner, 1804). *Parahypopta radoti* (Homberg, 1911) **stat. n.** proves to be a distinct species.

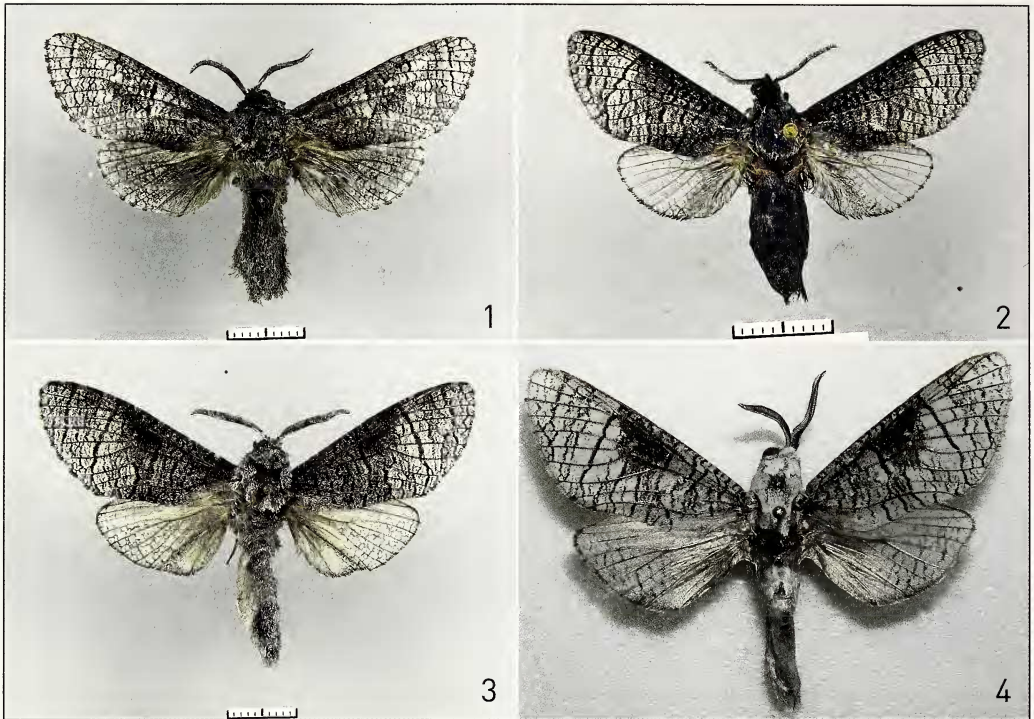
1. *Acosus* Dyar, 1905

Type species: *Cossus undosus* Lintner, 1878

Genus *Acosus* was described by Dyar (1905) for the North American *Cossus undosus* Lintner, 1878 and since 1905 the name was used only for representatives of the Nearctic fauna. Ureta (1957) described from Chile *Acosus comadioides* from Chile, a name that was later synonymised with *Rhizocossus munroei* Clench, 1957 (Gentili 1985). Half a century after the description of *Acosus*, Daniel (1956) described the genus *Lamellocossus*, to exclude *Bombyx terebra* Denis et Schiffermüller, 1775 from *Cossus* Fabricius, 1793 with which it had been associated. As the main diagnostic character, Daniel mostly used the antennal structure of the male. *Bombyx terebra* clearly differs in this character from the type species *Cossus cossus* (Linnaeus, 1756), because of its bipectinate antenna. Later, Russian authors (Zagulyaev 1978; Chistyakov 1999; Yakovlev 2004) soundly stressed the differences between *Cossus* and *Lamellocossus*. A new species, *Lamellocossus viktor* Yakovlev, 2004 was described from the *terebra*-group; it inhabits the arid regions of South Tuva (the northern part of the Great Lake Hollow, at Lake Tere-Khol' and the Tes Khem River) and should occur also in northern Mongolia.

While studying material of the private collections by Thomas Witt (Munich) and Armin Hauenstein (Untermünkheim) and after an assessment of the literature I found that *Acosus undosus* and *A. centerensis* (Lintner, 1877) specimens from Canada presented striking external similarities with *Lamellocossus* specimens. My examination of the genitalia of both North American species showed them to be nearly identical with those of *Lamellocossus terebra*. The external traits, antenna and male genitalia structure leave no doubt that *L. terebra* and *L. viktor* belong to *Acosus*, which is thus Holarctic in range. Hitherto, the only known Holarctic taxon of Cossidae was *Zeuzera pyrina* (Linnaeus, 1761) (Hodges, 1983), which, however, quite probably was introduced to North America by man.

Diagnosis: Medium-sized, gray-colored moths. Antenna bipectinate, each segment with two long processes. Thorax and abdomen with dense pubescence of gray hairy scales. Fore wing gray, somewhat darker at base, with wavy streaky pattern through-



Figs 1–4. Adults of *Arossus*. 1. *A. undosus*, male, Canada, British Columbia, Hazelton, 30 km N Kispiox River, Resort, 400 m, 3.08.–10.08.1999, leg. S. Ortner, Museum Witt, München. 2. *A. centerensis*, male, Canada, British Columbia, Interior Caribou Mountains, Lake Canim, 900 m, 26.07.–3.08.1997 coll. Hauenstein, Untermünkheim. 3. *A. terebra*, male, Russia, W. Altai Mts. [Altaiiskii Krai Region, Zmeinogorskii district], 5 km south of Samarka, 800 m, 25–26.07.1993, leg. Z. Varga, Museum Witt, München. 4. *A. viktor*, holotype, Zoological Institute, St. Petersburg.

out; fringe checkered. Hindwing somewhat lighter gray, often with an expressed wavy streaky pattern.

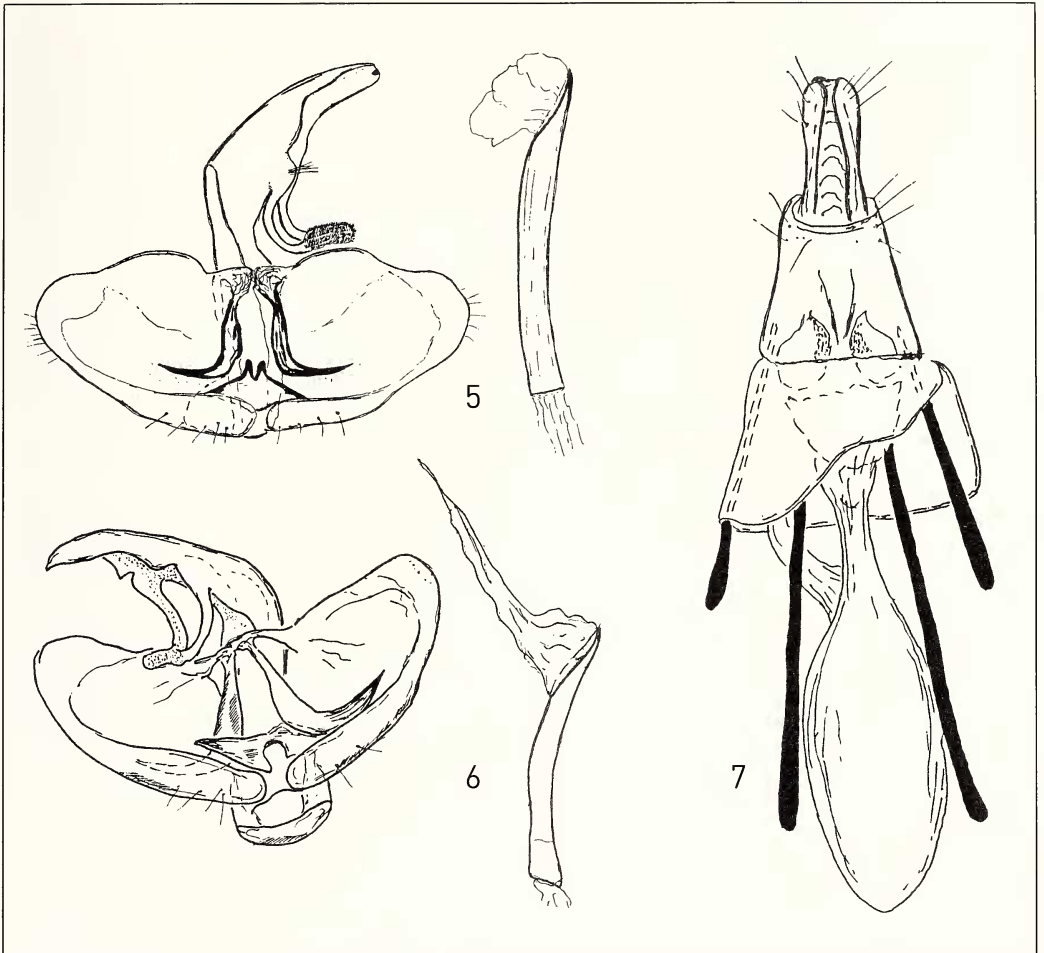
Male genitalia. Uncus long, beak-like; gnathos arms long and quite thick, quite large at point of fusion, covered with fine spinules. Valva broad, cup-like, swollen, with convex costal margin. Arms of transtilla strongly sclerotised, hook-shaped, pointed. Juxta small, strongly sclerotised; saccus weakly expressed. Phallus weakly curved, relatively thick and long; vesica opening dorso-apical, at about one third of phallus length.

Female genitalia. Oviscapt short. Apophyses posteriores very long; papillae anales elongate and smoothly rounded apically; anthrum immersed; ductus bursae wide membranous; bursa ellipsoid, without signa; ductus seminalis from base of bursa base near connection of ductus bursae.

Diversity. The genus includes five species:

Arossus undosus (Lintner, 1878: 243) (*Cossus*) (Figs 1, 5), occurring in Canada and the USA (Barnes & McDunnough 1911; Schoorl 1990).

Arossus populi (Walker, 1856: 1515) (*Cossus*), occurring in Canada and the USA (Barnes & McDunnough 1911; Schoorl 1990).



Figs 5–7. Genitalia of *Acosus*. 5. *A. undosus*, male. 6. *A. terebra*, male (Chistyakov 1999). 7. *A. terebra*, female (Chistyakov 1999).

Acosus centerensis (Lintner, 1877: 129) (*Cossus*) (Fig. 2) occurring in Canada and the USA (Barnes & McDunnough 1911; Schoorl 1990).

Acosus terebra (Denis & Schiffermüller, 1775: 60) (*Bombyx*) **comb. n.** (Figs 3, 6–7) occurring in Eurasia (Israel, Turkey, northern Spain, middle and southern Europe, southern Sweden, Finland, Baltic States, Ukraine, central part of European Russia, Caucasus, southern Siberia including the Altai and Sayan Mts. to S. Yakutia, southern part of Far East, Korea, Heilongjiang, Jilin, inner Mongolia (de Freina & Witt 1990; Hua et al. 1990; Yakovlev 2004).

Acosus viktor (Yakovlev, 2004), (*Lamellocossus*) **comb. n.** (Fig. 4) occurring in Russia, southern Siberia, southern part of Tuva Republic.

Note. *Fania connectus* Barnes et McDunnough, 1916, formerly treated in *Acosus*, has been transferred to *Fania* Barnes, McDunnough, 1911 (Schoorl 1990), which is followed here.

Remarks. *Acosus* belongs to Cossinae Leach, 1815, is similar to the Palearctic *Cossus*, *Gobibatyr* Yakovlev, 2004 (type species: *Cossus colossus* Staudinger, 1887) and the North American *Prionoxystus* Grote, 1882 (type species: *Cossus robiniae* Peck, 1818).

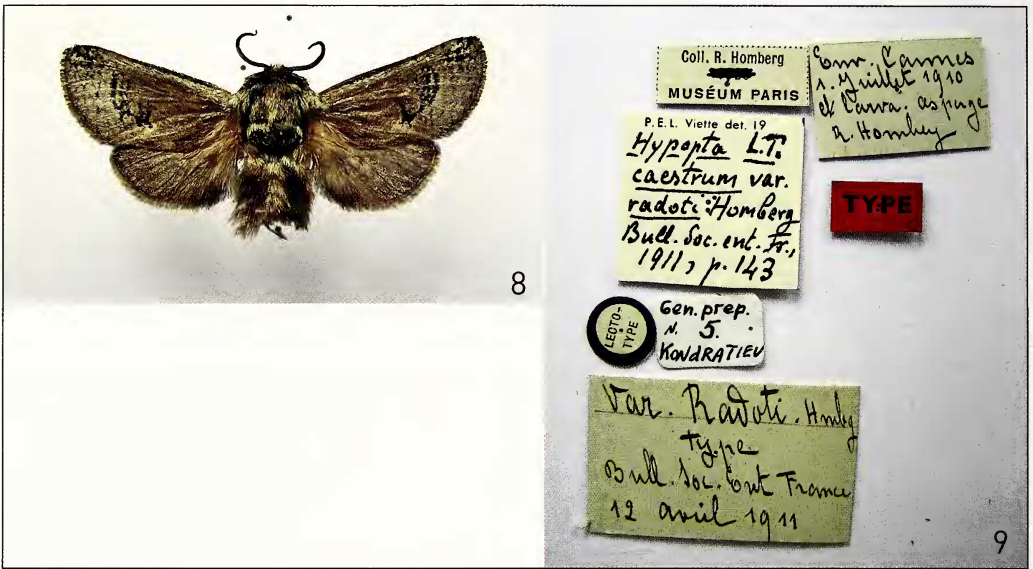


Fig. 8. *Parahypopta radoti*, lectotype. Fig. 9. Labels of the lectotype of *Parahypopta radoti* (Homberg, 1911).

2. *Parahypopta radoti* (Homberg, 1911) stat. n.

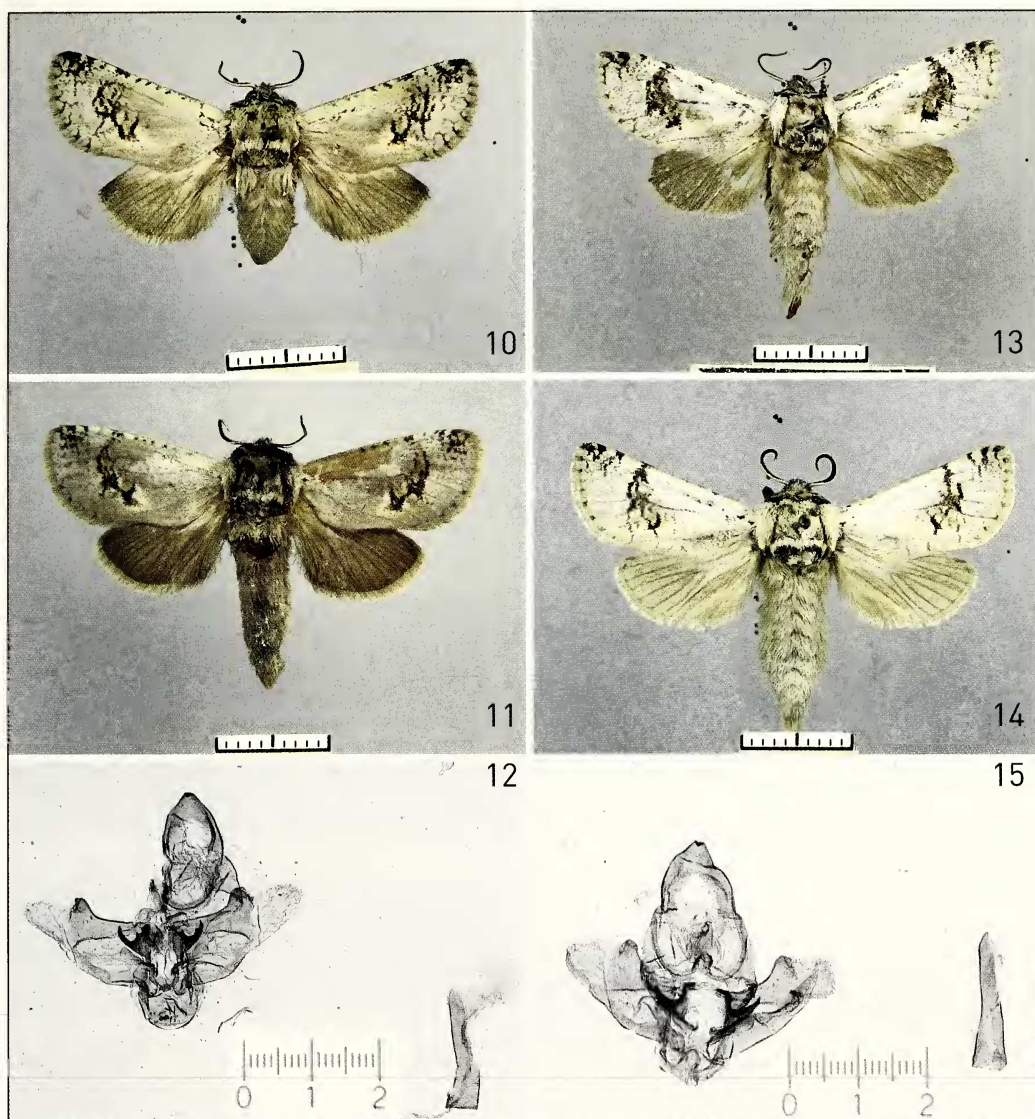
Figs 8–12

Hypopta radoti Homberg, 1911. Type locality: France, Alpes-Maritimes, Cannes.

Hypopta caestrum radoti Homberg, 1911: 143–144. Type locality: France, Alpes-Maritimes, Cannes.

Homberg (1911) briefly described *Hypopta caestrum radoti*, pointing out the dark pattern of the specimens, collected at Cannes (Alpes-Maritimes). Seitz (1912: 424) and Dalla Torre (1923: 22) considered this taxon as a subspecies of *Parahypopta caestrum*. Daniel (1961: 161–162) wrote that *Parahypopta radoti* is «eine Zustandsform oder Mutation, die im Bereich einer engen Population einmal die vorherrschende Form werden kann», thus not considering these moths as a valid taxon. Leraut (1980: 52) mentioned *Parahypopta radoti* Homberg, 1911 as a junior synonym of *Parahypopta caestrum* (Hübner, 1804). De Freina & Witt (1990: 22) adopted the opinion of the previous authors and noted that “Neben den bei Cossiden üblichen Größendifferenzen einzelner Populationen zeigt sich ... auch schiefergrau verdunkelte Individuen, die innerhalb jeder Population mehr oder weniger häufig auftreten können: f. *radoti* Homberg, 1911”. This taxon was not been mentioned in the comprehensive list of the lepidopteran fauna of Europe by Karsholt & Razowski (1996). In the Muséum National d’Histoire Naturelle Paris (MNHN), I investigated the lectotype (designated below) of *Hypopta caestrum radoti* and several topotypical specimens, including syntypes. I found that this taxon is a valid species, clearly distinct from *Parahypopta caestrum* (Hübner, 1804) by external characters as well as the male genitalia structure.

Description. Male. Fore wing length 12–13 mm. Fore wing whitish-brown, with a row of small roundish brown spots at costal margin; there are several brown spots partly fused to each other; submarginal area somewhat lighter than the rest of wing area; entire central part of wing occupied by a dark-brown spot in postdiscal area with



Figs 10–15. *Parahypopta* spp. **10.** *P. radoti*, male, Cannes, MNHN. **11.** *P. radoti*, female, Cannes, MNHN. **12.** *P. radoti*, male genitalia. **13.** *P. caestrum*, male, Hungary. **14.** *P. caestrum*, female, Hungary. **15.** *P. caestrum*, male genitalia.

wavy transversal lines; wing basal area without pattern. Fringe checked dark at veins and light between them. Hind wing brown without pattern; with a light-brown fringe. Male genitalia. Uncus triangular, wide, with a membranous zone on its upper surface. Tegumen wide. Gnathos arms very stout and robust, gnathos covered with small spinules, especially dense laterally. Valva broad, distal end membranous and mobile; costal margin with robust trapeze-shaped processus with slightly dentate margin. Arms of transtilla with wide bases and curved and pointed ends. Juxta carina-shaped with broad weakly sclerotized lateral processes, slightly widening apically. Saccus wide,

semicircular. Phallus stout, slightly curved, with slantingly cut at distal end; vesica with opening dorso-apically and occupying about half of phallus length; without cornuti.

Diagnosis. Clearly differs from *P. caestrum* (Figs 13–15) by the much darker wing coloration, the slightly shorter forewing with rounded apex, and details of the male genitalia structure: the somewhat wider juxta, the much more developed processus on the costal margin of the valva, the shorter and less curved arms of transtilla, the curved phallus.

Taxonomical notes. Taking into account the complicated taxonomy within this group, it is necessary to fix the name *Parahypopta radoti* to a specific specimen. Many syntypes of *Hypopta caestrum radoti* are preserved in the Natural History Museum of the Humboldt University of Berlin, the Zoologische Staatssammlung des Bayerischen Staates of Munich and there is one specimen labelled as lectotype at the MNHN Paris. However, according to my own data the lectotype designation has not been published. Thus, to preserve the selection of this specimen, I hereby designate it as the lectotype. The specimen (Fig.8) bears the following labels (Fig.9): (1) Red, rectangular, with 'Type' printed typographically; (2) White, rectangular, with 'Coll. R. Homberg | Muséum Paris' printed typographically; (3) White, rectangular, with R. Homberg's hand-writing in black ink 'Env. Cannes | 1. Juillet 1910 | ex larva. as page | R. Homberg'; (4) White, rectangular, with R. Homberg's hand-writing in black ink 'Var. *Radoti*. Hmbg. | Type | Bull. Soc. Ent. France | 12 avril 1911'; (5) White, rectangular, with five lines of text of which the first is typographically printed while the rest are written in black ink by P. Viette's hand as follows 'P.E.L. Viette det. 19 | *Hypopta* L. T. | *caestrum* var. | *radoti* Homberg | Bull. Soc. Ent. Fr., | 1911, p. 143'; (6) White, circular, with black margin, with typographically printed 'LECTO- | TYPE'; (7) White, rectangular, with A. Kondratyev's hand-writing in black ink 'gen. prep. | №. 5. | Kondratiev'; (8) Red, rectangular, with the following hand-written text in black ink: 'LECTOTYPE | *Hypopta caestrum* Hb. | var. *Radoti* Homberg, 1911 | des. R. V. Yakovlev'.

Distribution. Reliably known only from the type locality. A clarification of the range is planned in the course of a revision of the genus *Parahypopta* Daniel, 1961.

Acknowledgements

I am thankful to all who helped me to prepare this work: A. Hauenstein (Untermünkhein), O. Kosterin (Novosibirsk), J. Minet (Paris), T. J. Witt (Munich), and V. Zolotuhin (Ulyanovsk).

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